Taste Disturbance After Palatopharyngeal Surgery for Obstructive Sleep Apnea*

Han-Ren Hsiao and Hsueh-Yu Li
Department of Otolaryngology, Chang Gung Memorial Hospital, Taipei, Taiwan.


Taste disorder is a rare complication of uvulopalatopharyngoplasty, and may have a significant impact on quality of life. Herein, we report a case of obstructive sleep apnea syndrome in a 51-year-old man who experienced taste disturbance after palatopharyngeal surgery using electrocautery for developing a uvulopalatal flap. Gustatory function test using three-drop-method with solutions of highest concentration was implemented to assess the deficiency of four basic tastes. The results showed deficit of sweet taste associated with phantom of bitter taste. The patient reported constant spontaneous bitter taste and dysgeusia in sweet taste with poor quality of life at the 2-year follow-up. We suggest that patients are informed of the potential for taste impairment from palatopharyngeal surgery, as well as reducing the use of electrocautery in developing uvulopalatal flap to reduce damage to taste function.

Key Words: obstructive sleep apnea, palatopharyngeal surgery, taste disturbance

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Address correspondence and reprint requests to: Dr Hsueh-Yu Li, Department of Otolaryngology, Chang Gung Memorial Hospital, 5 Fu-Shin Street, Kweishan, Taoyuan, Taiwan. E-mail: hyli38@adm.cgmh.org.tw

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Uvulopalatopharyngoplasty (UPPP) has become a common treatment modality for snoring or obstructive sleep apnea (OSA) syndrome [1]. Complications of UPPP include hemorrhage, infection, velopharyngeal insufficiency and nasopharyngeal stenosis. Among the various complications after UPPP surgery, little attention has focused on taste disturbance, with very few reports in the literature. A MEDLINE search showed that taste disturbance might comprise 7–10% of postoperative complications of UPPP [2]. Although rarely appreciated, taste disturbance could alter food choices and pattern of consumption, induce significant distress, produce weight loss and even decrease quality of life [3].

Herein, we report a 51-year-old man who experienced taste distortion over a 2-year period after palatopharyngeal surgery for OSA. Gustatory function test was performed to investigate the deficiency of taste. Mechanism and causes of postoperative taste disturbance are also discussed.

CASE PRESENTATION

A 51-year-old man presented with severe OSA and complaint of snoring for several years. A fiberoptic nasopharyngoscope with Muller’s maneuver showed type I obstruction in Fujita classification. The patient underwent modified UPPP-extended uvulopalatal flap (EUPF) surgery. Electrocautery was used for developing an uvulopalatal flap to enlarge the retropalatal space and to prevent postoperative stenosis. Intraoperative blood loss was 100 mL. There were no complications during hospitalization. One month later,
he reported persistent bitter taste even with no food passage. An oral examination showed normal mucosa healing in tonsillar bed and soft palate. Serum zinc level was 0.1 mg/dL, within the normal range (0.07–0.12 mg/dL). Gustatory function test using three-drop-method with solutions of the highest concentration (taste could be identified by approximately 100% of subjects) was implemented to assess the deficiency of taste [4]. Four basic tastes (sweet, sour, salty and bitter) were used to identify the nature of taste. The concentrations included sweet: sucrose, 4 mg/dL; sour: citric acid, 0.75 mg/dL; salty: sodium chloride, 2.5 mg/dL; bitter: quinine hydrochloride, 0.015 mg/dL [4]. Using a 10 mL pipette, a series of three drops of liquid were placed on the middle of the patient’s extended tongue to assess the kind of taste. Only one drop contained a taste solution; the other two drops were distilled water. The sequence of administration was randomized across the trial. The patient then swallowed the solution and reported whether or not a taste sensation was present and, if so, the nature of taste. The results showed that he had impairment of the sense of sweet taste (sugar). Otherwise, salty (salt), sour (citric acid), and bitter (quinine) were properly recognized. After 2-year follow-up, gustatory function test revealed restoration of sweet taste. However, the patient reported constant spontaneous bitter taste in daily life.

**DISCUSSION**

Taste disturbance following UPPP is rarely reported in the literature. In this case, the patient suffered from taste disturbance (loss of sweet taste and phantom of metallic taste) after EUPF surgery and the condition persisted for 2 years with a significant impact on his quality of life.

The most frequently reported complications after UPPP were airway compromise, bleeding, nasal regurgitation, difficulty in swallowing and pharyngeal dryness [5]. Taste disturbance comprised 7–10% of all post-UPPP complications [2]. This suggests that OSA patients must be informed of the potential risk of taste disturbance prior to UPPP surgery.

Among various gustatory function tests (impregnated taste strips, electrogustometry, spatial taste test as well as anesthesia of localized regions of tongue), the three-drop-method using the four flavors (sweet, salty, sour and bitter) has been widely used to assess basic tastes in the clinical setting because of its relative simplicity, cheapness, availability, and noninvasiveness [4]. Highest concentration (taste could be identified by approximately 100% of subjects) was commonly used to assess the deficiency of taste due to high test–retest reliability and easy interpretation [4].

Causes of taste disturbance after palatopharyngeal surgery for OSA may include damage to the lingual branch of the glossopharyngeal nerve (LBGN) [6], and excessive excision of soft palate leading to detriment of the palatal taste nerve (Figure) [2].

Direct or indirect damage to the LBGN may cause taste dysfunction. A study revealed that the LBGN firmly adhered to the tonsillar bed in 21% of cadaveric specimens, and bed separating the tonsil from the LBGN was observed in another 55% [7]. Additionally, there was only a 2–4 mm gap between the lower pole of the palatine tonsil and the LBGN [8]. In this case, intraoperative bleeding was 100 mL and electrocautery...
was widely used for hemostasis in the wound of tonsillar bed. We therefore speculate that thermal injury to the LBGN by electrocautery for hemostasis at the inferior tonsillar pole may have played a role in contributing to postoperative taste disturbance.

Taste nerves of human palate are distributed on the soft palate arising from the greater petrosal nerve [9]; amputation of this nerve induced a fairly broad area of ageusia on the soft palate [10]. Kamel reported that excessive excision of the soft palate during UPPP could lead to hypogeusia [2]. Ikeda et al reported that the most sensitively perceived taste at the soft palate is a sweet taste in the majority of subjects [9]. In this case, electrocautery was used for developing the uvulopalatal flap instead of cold instrument. Thermal injury from electrocautery may damage the taste nerves distributed on the soft palate leading to loss of taste acuity. The deficiency of sweet taste in this case can likely be ascribed to the fact that the most sensitively perceived taste at the soft palate is a sweet taste. Accordingly, excessive damage of taste nerves on the soft palate could lead to loss of sense of sweet taste.

Taste phantoms occur when taste input is received in the absence of actual stimulation [11]. The occurrence of phantom taste is hypothesized to be due to a compensatory mechanism when the LBGN is damaged; contralateral nerve increased its sensitivity, resulting in hypersensitive and overcompensation and subsequent bitter or metallic phantogeusia. Our patient experienced phantogeusia as metallic-like taste, which is similar to a previous report of tonsillectomy [3]. This sense of a metallic or bitter taste is probably derived from an evolutionary shield to avoid potential toxins since these chemicals often possess a metallic or bitter taste.

Taste disorders, although uncommon, are potential complications following palatopharyngeal surgery, and should be explained to patients before their consent to surgery. Gustatory function test is indicated to assess the deficiency of taste if dysgeusia is present postoperatively. We suggest the meticulous use of electrocautery in hemostasis particularly at the inferior tonsillar fossa and in developing the uvulopalatal flap during palatopharyngeal surgery to reduce thermal injury to the taste nerve leading to postoperative taste disturbance.

REFERENCES

懸雍垂顱咽手術之味覺障礙 —
病例報告

蕭涵仁 李學禹
林口長庚紀念醫院 耳鼻喉部

懸雍垂顱咽手術後造成的味覺障礙雖然罕見，但對生活品質可能有很大衝擊。我們提出一 51 歲男性睡眠呼吸中止症病患，接受以電燒剝開顱咽皮瓣之懸雍垂顱咽手術。病患於術後抱怨味覺障礙，我們使用三滴試液法 (three-drop-method) 作味覺測試，結果顯示病人的甜味喪失併有自發性苦味，經追蹤兩年，此病人仍困擾於味覺失真及自發性苦味，食慾大受影響，體重明顯下降，生活品質亦自覺不佳。因此，我們建議應在術前針對有需要接受懸雍垂顱咽手術之病人，告知此項可能之併發症；並在術中減少使用電燒剝開顱咽皮瓣，以減少術後發生味覺障礙的機會。本文中亦就味覺障礙之檢驗方法及顱咽手術造成味覺障礙之可能原因加以討論。

關鍵詞：阻塞型睡眠呼吸中止症，懸雍垂顱咽手術，味覺障礙
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